

Focus Area Level KS/PI

Industrial and Engineering Systems - Career Area

Construction - Cluster

Focus Area:

Construction Crafts

Industry-Based Knowledge and Skill Sets with Performance Indicators (KS/PI)

Industry-Based Knowledge and Skill

COPB01.01 Perform math operations to complete a construction jobsite/workplace tasks (e.g., estimating, distributing materials and supplies).

Performance Indicators:

Delivery Level

| | | |
|-----------------|---|-------------|
| COPB01.01.01.00 | Use geometric formulas to determine areas and volumes of various structures. | High School |
| COPB01.01.01.01 | Calculate areas and volumes of structures. | High School |
| COPB01.01.01.03 | Identify shapes used in the construction industry. | High School |
| COPB01.01.02.00 | Use appropriate formulas to determine percentages /decimals. | High School |
| COPB01.01.02.01 | Convert decimals to percents and percents to decimal. | High School |
| COPB01.01.02.02 | Convert fractions to decimals and decimals to fractions. | High School |
| COPB01.01.02.03 | Add, subtract, multiply and divide decimals with and without a calculator. | High School |
| COPB01.01.03.00 | Use appropriate formulas to determine ratios, fractions, and proportion measures. | High School |
| COPB01.01.03.01 | Calculate ratios, fractions and proportion measures. | High School |
| COPB01.01.03.02 | Use ratios, fractions and proportion measures to perform measurement tasks. | High School |
| COPB01.01.04.00 | Use appropriate formulas to determine measurements of dimensions, spaces, structures and temperature. | High School |
| COPB01.01.04.01 | Measure dimensions, spaces and structures using U.S. Standard unit. | High School |
| COPB01.01.04.02 | Measure dimensions, spaces and structures using Metric units. | High School |
| COPB01.01.04.04 | Explain the metric system and how important it is in construction. | High School |
| COPB01.01.04.05 | Add, subtract, multiply and divide whole numbers with and without a calculator. | High School |
| COPB01.01.04.06 | Use a standard ruler. | High School |
| COPB01.01.04.07 | Use a metric ruler. | High School |

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Industrial and Engineering Systems - Career Area
Construction - Cluster
Industry-Based Knowledge and Skill
COPB01.03 Follow safety and health procedures while working in the construction industry.

| <i>Performance Indicators:</i> | <i>Delivery Level</i> |
|--|-----------------------|
| COPB01.03.03.00 Use hand, power tools and equipment safely. | High School |
| COPB01.03.03.01 Perform safety inspections of equipment and tools. | High School |
| COPB01.03.03.02 Demonstrate appropriate safe use of hand and power tools. | High School |
| COPB01.03.03.03 Interpret manufacturer specifications and intended uses for equipment and tools. | High School |
| COPB01.03.03.04 Identify and use Personal Protective Equipment (PPE). | High School |
| COPB01.03.03.05 Describe safe behavior on and around ladders and scaffolds. | High School |
| COPB01.03.04.00 Maintain tools and clean work area in a timely manner. | High School |
| COPB01.03.04.01 Properly clean tools and equipment. | High School |
| COPB01.03.05.00 Safely lift heavy objects. | High School |
| COPB01.03.05.01 Demonstrate correct procedure for lifting heavy objects. | High School |
| COPB01.03.06.00 Work safely around electricity. | High School |
| COPB01.03.06.01 Describe electrical hazards in buildings. | High School |
| COPB01.03.06.03 Identify hot, cold and neutral electrical wires. | High School |
| COPB01.03.07.01 Mix materials correctly according to manufacturer specifications. | High School |

Industry-Based Knowledge and Skill
COPB01.04 Read, understand and respond to English language technical and workplace documents to effectively function in the workplace/jobsite.

| <i>Performance Indicators:</i> | <i>Delivery Level</i> |
|---|-----------------------|
| COPB01.04.01.03 Use verbal or written processes to report key information. | High School |
| COPB01.04.01.04 Use technology to transmit reports. | High School |
| COPB01.04.01.05 Read, understand and interpret blueprints, drawings and specifications. | High School |
| COPB01.04.01.07 Read and follow manufacturer's instructions and manuals. | High School |

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Industry-Based Knowledge and Skill

COPB01.05 Write clear and effective English to prepare workplace/jobsite information.

Performance Indicators:
Delivery Level

COPB01.05.01.01 Compose an accurate and organized diary/log of work. High School

Industry-Based Knowledge and Skill

COPB02.02 Listen to and speak with a variety of individuals to enhance communication skills.

Performance Indicators:
Delivery Level

COPB02.02.01.00 Speak succinctly and clearly to convey information. High School

COPB02.02.01.01 Speak so that others can understand and carry out information presented. High School

COPB02.02.02.00 Listen attentively to spoken messages to respond to information. High School

COPB02.02.02.01 Perform oral instructions. High School

Industry-Based Knowledge and Skill

COPB04.01 Use information technology tools specific to Construction industry to access, manage, integrate and create information.

Performance Indicators:
Delivery Level

COPB04.01.01.00 Manage personal schedule and contact information. High School

COPB04.01.01.01 Create tasks (to-do) list. High School

COPB04.01.01.03 Manage personal and professional contact information. High School

COPB04.01.02.00 Create memos and notes. High School

COPB04.01.02.01 Create personal reminders. High School

COPB04.01.02.02 Create and send notes, informal memos, and reminders using applications. High School

Industry-Based Knowledge and Skill

COPB04.02 Use electronic mail applications.

Performance Indicators:
Delivery Level

COPB04.02.01.00 Use email to communicate within and across organizations. High School

COPB04.02.01.01 Access email system using login and password functions. High School

COPB04.02.01.02 Access email messages received. High School

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|-----------------|---|-------------|
| COPB04.02.01.03 | Create email messages in accordance with established business standards (e.g., grammar, word usage, spelling, sentence structure, clarity, e-mail etiquette). | High School |
| COPB04.02.01.04 | Practice email etiquette. | High School |
| COPB04.02.01.05 | Send email messages. | High School |
| COPB04.02.02.00 | Use email to share files and documents. | High School |
| COPB04.02.02.01 | Access email attachments. | High School |
| COPB04.02.02.02 | Attach documents to messages. | High School |
| COPB04.02.02.03 | Save email messages/attachments. | High School |
| COPB04.02.02.04 | Practice contamination protection strategies for email. | High School |

Industry-Based Knowledge and Skill
COPB04.03 Use Internet applications.

| <i>Performance Indicators:</i> | | <i>Delivery Level</i> |
|--------------------------------|---|-----------------------|
| COPB04.03.01.00 | Search for information and resources. | High School |
| COPB04.03.01.01 | Select search engine(s) to use. | High School |
| COPB04.03.01.02 | Select appropriate search procedures and approaches. | High School |
| COPB04.03.01.03 | Locate information using search engine(s) and Boolean logic. | High School |
| COPB04.03.01.04 | Navigate web sites using software functions. | High School |
| COPB04.03.02.00 | Access and evaluate Internet resources. | High School |
| COPB04.03.02.01 | Access business and technical information using the Internet. | High School |
| COPB04.03.02.02 | Access commercial, government, and education resources. | High School |
| COPB04.03.02.03 | Evaluate Internet resources (e.g., accuracy of information). | High School |

Industry-Based Knowledge and Skill
COPB04.04 Use writing/publishing applications.

| <i>Performance Indicators:</i> | | <i>Delivery Level</i> |
|--------------------------------|---|-----------------------|
| COPB04.04.01.00 | Prepare simple documents and other business communications. | High School |
| COPB04.04.01.01 | Retrieve existing documents. | High School |

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|-----------------|---|-------------|
| COPB04.04.01.02 | Create documents (e.g., letters, memos, reports) using existing forms and templates. | High School |
| COPB04.04.01.03 | Safeguard documents using name and save functions. | High School |
| COPB04.04.01.04 | Format text using basic formatting functions. | High School |
| COPB04.04.01.05 | Employ word processing utility tools (e.g., spell checker, grammar checker, thesaurus). | High School |

Industry-Based Knowledge and Skill
COPB04.06 Use spreadsheet applications.

| <i>Performance Indicators:</i> | | <i>Delivery Level</i> |
|--------------------------------|---|-----------------------|
| COPB04.06.01.00 | Create a spreadsheet. | High School |
| COPB04.06.01.01 | Create spreadsheets. | High School |
| COPB04.06.01.02 | Retrieve existing spreadsheets. | High School |
| COPB04.06.01.03 | Edit spreadsheets. | High School |
| COPB04.06.01.04 | Save spreadsheets. | High School |
| COPB04.06.01.05 | Print spreadsheets. | High School |
| COPB04.06.02.01 | Group worksheets. | High School |
| COPB04.06.02.02 | Create charts and graphs from spreadsheets. | High School |
| COPB04.06.02.03 | Perform calculations using simple formulas. | High School |
| COPB04.06.02.04 | Input/process data using spreadsheet functions. | High School |

Industry-Based Knowledge and Skill
COPB04.09 Use computer operations applications.

| <i>Performance Indicators:</i> | | <i>Delivery Level</i> |
|--------------------------------|--|-----------------------|
| COPB04.09.01.00 | Manage computer operations. | High School |
| COPB04.09.01.01 | Apply basic commands of operating system software. | High School |
| COPB04.09.01.02 | Employ desktop operating skills. | High School |
| COPB04.09.02.00 | Manage file storage. | High School |
| COPB04.09.02.01 | Apply appropriate file and disk management techniques. | High School |
| COPB04.09.02.02 | Differentiate between files and directories. | High School |
| COPB04.09.02.03 | Determine file organization. | High School |

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COPB04.09.02.04 Use system utilities for file management.

High School

Industry-Based Knowledge and Skill
COPB05.01 Complete a construction project (project management).
Performance Indicators:
Delivery Level

COPB05.01.01.01 Write a project goal.

High School

COPB05.01.01.03 Write two or three objectives.

High School

COPB05.01.01.04 Prepare a list of resources required for a construction project.

High School

COPB05.01.02.00 Complete a construction project on time.

High School

COPB05.01.02.01 Generate a timeline or schedule for an industrial and engineering project.

High School

COPB05.01.02.02 Prioritize action items.

High School

COPB05.01.02.04 Create a list of action items.

High School

Industry-Based Knowledge and Skill
COPB07.01 Demonstrate teamwork.
Performance Indicators:
Delivery Level

COPB07.01.02.02 Complete your share of the work while on a construction team.

High School

COPB07.01.02.05 Demonstrate effective listening skills.

High School

Industry-Based Knowledge and Skill
COPB08.01 Exhibit personal accountability, integrity and responsibility to enhance confidence among co-workers.
Performance Indicators:
Delivery Level

COPB08.01.01.02 Maintain personal integrity.

High School

COPB08.01.01.04 Recognize integrity in others.

High School

Industry-Based Knowledge and Skill
COPB09.01 Exhibit a positive work ethic to comply with employment requirements.
Performance Indicators:
Delivery Level

COPB09.01.01.00 Exhibit behaviors showing you are reliable and dependable.

High School

COPB09.01.01.01 Arrive at work fit and on time each day.

High School

COPB09.01.01.02 Behave dependably.

High School

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|-----------------|---|-------------|
| COPB09.01.01.03 | Behave honestly and fairly. | High School |
| COPB09.01.02.00 | Maintain appropriate dress and behavior for the job to contribute to a safe and effective workplace/jobsite. | High School |
| COPB09.01.02.01 | Observe company and workplace/jobsite rules. | High School |
| COPB09.01.03.00 | Complete required employment forms and documentation such as I-9 form, work visa, W-4 and licensures to meet employment requirements. | High School |
| COPB09.01.03.01 | Provide verification that requirements have been met. | High School |

Industry-Based Knowledge and Skill
COPB09.03 Recognize requirements for career advancement to plan for continuing education and training.

| <i>Performance Indicators:</i> | | <i>Delivery Level</i> |
|--------------------------------|--|-----------------------|
| COPB09.03.01.00 | Identify opportunities for career advancement to formulate career goals. | High School |
| COPB09.03.01.01 | Identify career ladder. | High School |
| COPB09.03.01.02 | Develop career advancement plan. | High School |
| COPB09.03.01.03 | Implement career advancement plan. | High School |
| COPB09.03.01.04 | Review progress of career advancement plan. | High School |
| COPB09.03.02.00 | Maintain positive interpersonal skills to enhance advancement potential. | High School |
| COPB09.03.03.00 | Pursue education and training opportunities to acquire skills necessary for career advancement. | High School |
| COPB09.03.03.01 | Document successful completion of education and training opportunities. | High School |
| COPB09.03.03.02 | Participate in professional development opportunities such as professional organizations and associations, trade shows and seminars. | High School |
| COPB09.03.04.00 | Read trade magazines and journals, manufacturers' catalogues, industry publications and internet sites to keep current on industry trends. | High School |
| COPB09.03.04.01 | Identify and prepare for new and emerging occupations, practices and procedures as well as declining occupations and practices. | High School |
| COPB09.03.05.00 | Examine the organization and structure of various segments of the industry to prepare for career advancement. | High School |

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|-----------------|---|-------------|
| COPB09.03.05.01 | Recognize segments of the construction industry and show the relationships to specialty areas. | High School |
| COPB09.03.05.02 | Obtain necessary knowledge and skills to enhance employability. | High School |
| COPB09.03.06.00 | Research local and regional labor (workforce) market and job growth information to project potential for advancement. | High School |
| COPB09.03.06.01 | Identify sources of career information. | High School |
| COPB09.03.06.02 | Identify job opportunities for the trade. | High School |
| COPB09.03.06.03 | Identify organizations that offer career and job placement. | High School |
| COPB09.03.06.04 | Analyze potential growth of identified careers. | High School |
| COPB09.03.06.05 | Apply labor market and job growth information to career goals. | High School |

Industry-Based Knowledge and Skill
COPB09.04 Examine licensing, certification and credentialing requirements at the national, state and local levels to achieve compliance.

| <i>Performance Indicators:</i> | | <i>Delivery Level</i> |
|--------------------------------|--|-----------------------|
| COPB09.04.01.00 | Align licensing, certification and credentialing requirements to career goals in order to plan for career advancement. | High School |
| COPB09.04.01.01 | Use technologies and resources to research licensing certification and credentialing. | High School |
| COPB09.04.01.02 | Evaluate and select suitable sources of licensing, certification and credentialing. | High School |
| COPB09.04.01.03 | Identify licenses, certifications and credentials applicable to career goals. | High School |
| COPB09.04.01.04 | Document sources and agencies for licensing and certification and credentialing information including contact information. | High School |

Industry-Based Knowledge and Skill
COPB09.05 Recognize the responsibilities and personal characteristics of a professional craftsman to develop personal goals for professionalism.

| <i>Performance Indicators:</i> | | <i>Delivery Level</i> |
|--------------------------------|---|-----------------------|
| COPB09.05.01.00 | Research workplace/jobsite information to identify appropriate craft responsibilities and personal characteristics. | High School |

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|-----------------|--|-------------|
| COPB09.05.01.01 | Practice the responsibilities and characteristics of a professional craftsman. | High School |
| COPB09.05.01.02 | Identify all critical/important functions. | High School |
| COPB09.05.02.00 | Present a professional image in the workplace/jobsite to enhance career advancement. | High School |
| COPB09.05.02.01 | Maintain appropriate professional memberships. | High School |
| COPB09.05.02.02 | Follow rules, regulations and guidelines. | High School |

Industry-Based Knowledge and Skill
COPB09.06 Maintain a career portfolio to document knowledge, skills and abilities.
Performance Indicators:
Delivery Level

| | | |
|-----------------|---|-------------|
| COPB09.06.01.00 | Select educational and work history highlights to create a personal resume. | High School |
| COPB09.06.01.01 | Develop a resume utilizing word processing technology. | High School |
| COPB09.06.02.00 | Contact professional references to acquire recommendations. | High School |
| COPB09.06.02.01 | Obtain appropriate letters of recommendation. | High School |
| COPB09.06.03.00 | Maintain a record of work experiences, licenses, certifications and education to build a portfolio. | High School |
| COPB09.06.03.01 | Document work experience. | High School |
| COPB09.06.03.02 | Document receipt of licenses, certifications and credentialing. | High School |
| COPB09.06.03.03 | Document completion of education and training. | High School |

Industry-Based Knowledge and Skill
COPB09.07 Develop a career plan to achieve personal, education and career goals.
Performance Indicators:
Delivery Level

| | | |
|-----------------|---|-------------|
| COPB09.07.01.00 | Explore occupations within a construction sector. | High School |
| COPB09.07.01.01 | Explain the apprenticeship system. | High School |
| COPB09.07.02.00 | Describe appropriate routes for entry into construction occupations. | High School |
| COPB09.07.02.01 | Use labor market information. | High School |
| COPB09.07.03.00 | Demonstrate job prospecting skills appropriate for the construction industry. | High School |
| COPB09.07.03.01 | Complete a job application. | High School |

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|-----------------|---------------------------------|-------------|
| COPB09.07.03.02 | Prepare a resume. | High School |
| COPB09.07.03.03 | Participate in a job interview. | High School |
| COPB09.07.03.04 | Write a thank you letter. | High School |

Industry-Based Knowledge and Skill

COPB10.01 Read technical drawings and documents to plan a project.

Performance Indicators:

Delivery Level

| | | |
|-----------------|--|-------------|
| COPB10.01.01.00 | Interpret blueprints and drawings to assist with project planning. | High School |
| COPB10.01.01.01 | Recognize elements and symbols of blueprints and drawings. | High School |

Industry-Based Knowledge and Skill

COPB10.02 Use and maintain appropriate tools, machines and equipment to accomplish project goals.

Performance Indicators:

Delivery Level

| | | |
|-----------------|--|-------------|
| COPB10.02.01.00 | Select tools, machinery and equipment to match requirements of the job. | High School |
| COPB10.02.01.01 | Operate tools, machinery and equipment. | High School |
| COPB10.02.01.02 | Properly maintain and care for tools, machines and equipment. | High School |
| COPB10.02.01.03 | Use tools, machine and equipment productively and efficiently in alignment with industry standards. | High School |
| COPB10.02.02.00 | Identify sources of information concerning state-of-the-art tools, equipment, materials, technologies and methodologies. | High School |
| COPB10.02.02.01 | Read current periodicals, industry publications and manufacturer's catalogs. | High School |
| COPB10.02.02.02 | Use state-of-the-art tools, equipment, materials, technologies and methodologies. | High School |

Industry-Based Knowledge and Skill

COPB10.03 Set up rigging.

Performance Indicators:

Delivery Level

| | | |
|-----------------|--|-------------|
| COPB10.03.01.00 | Use slings. | High School |
| COPB10.03.01.01 | Describe the use of slings. | High School |
| COPB10.03.01.03 | Describe hardware configurations and their proper connections. | High School |